AD-A154 524 NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS ASHMERE LAKE DAM MA 0.. (U) CORPS OF ENGINEERS WALTHAM MA NEW ENGLAND DIV AUG 78 1/1

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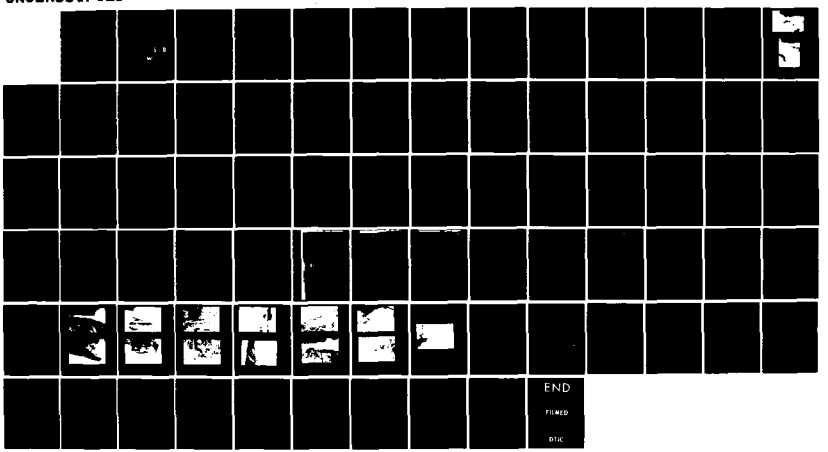

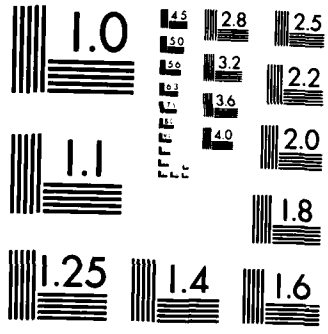

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HOUSATONIC RIVER BASIN
HINSDALE, MASSACHUSETTS

ASHMERE LAKE DAM
MA 00223

PHASE 1 INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

AUGUST 1978

UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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18. SUPPLEMENTARY NOTES

Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

DAMS, INSPECTION, DAM SAFETY,

Housatonic River Basin
Hinsdale, Massachusetts
Bennett Brook

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Ashmere Lake Dam is an earth embankment 1574 ft. long with a maximum height of 32.5 ft. A stone masonry spillway, 75 ft. long with a freeboard of 3.5 ft. is located at the east abutment. Since the dam is classified as intermediate in size with a high hazard potential, the test flood is the Probable Maximum Flood. There are a number of recommendations given in this report for implementation by the owner.

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DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:
NEDED

JUN 18 1979

Honorable Edward J. King
Governor of the Commonwealth of
Massachusetts
State House
Boston, Massachusetts 02133

Dear Governor King:

I am forwarding to you a copy of the Ashmere Lake Dam Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Environmental Quality Engineering, the cooperating agency for the Commonwealth of Massachusetts. In addition, a copy of the report has also been furnished the owner, the Commonwealth of Massachusetts, Forests and Parks Department, Department of Environmental Management, Lee, Massachusetts 01238, ATTN: Mr. Douglas Poland, Regional Supervisor.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Environmental Quality Engineering for your cooperation in carrying out this program.

Sincerely yours,

JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

ASHMERE LAKE DAM
MA 00223

HOUSATONIC RIVER BASIN
HINSDALE, MASSACHUSETTS

PHASE 1 INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

PHASE I REPORT
NATIONAL DAM INSPECTION PROGRAM

Inventory No.:	MA 00223
Name of Dam:	ASHMERE LAKE DAM
Town Located:	HINSDALE
County Located:	BERKSHIRE
State Located:	COMMONWEALTH OF MASSACHUSETTS
Stream:	BENNETT BROOK
Date of Inspection:	22 JUNE 1978

BRIEF ASSESSMENT

Ashmere Lake Dam is an earth embankment 1574 feet long with a maximum height of 32.5 feet. The crest is "dog-legged" at an angle of about 138° with the east and west legs of the embankment being 710 and 864 feet, respectively. A stone masonry spillway, 75 feet long with a freeboard of 3.5 feet is located at the east abutment. A 24 inch diameter low level outlet pipe is located at the base of the dam at the maximum section. Discharges from the spillway and low level outlet are into Bennett Brook to the East Branch of the Housatonic River.

Phase I inspection and evaluation of Ashmere Lake Dam does not indicate conditions which would constitute an immediate hazard to human life or property. Based on engineering judgment and the performance of the earth embankment and outlet works, the project is considered to be in good condition. The project, however, does have a number of deficiencies which, if not remedied, have the potential for developing into hazardous conditions.

Because there are no data on Probable Maximum Floods for a drainage area of 4.0 square miles, it was necessary to synthesize a test flood hydrograph for the contributing area. Since the dam is classified as intermediate in size, with a high hazard potential, the test flood, in accordance with Corps of Engineers guidelines, is the Probable Maximum Flood (PMF). The PMF yields an outflow of 5170 cfs which is greater than the combined maximum discharge capacity of the spillway and low level outlet of 1650 cfs and would result in an overtopping of the dam by about 4.8 feet. Since the dam will be overtopped by the test flood, it is considered that the spillway is inadequate from a hydraulic and hydrologic viewpoint.

A number of recommendations are given for implementation by the owner within 12 months of receipt of this Phase I Inspection Report. One of the recommendations is that the owner retain a competent consulting engineer to conduct further studies to determine what measures are necessary to improve discharge capacities.

In addition, remedial measures are recommended for implementation by the owner within 24 months of receipt of this Phase I Inspection Report to improve overall conditions. These measures, in general, are as follows:

- Programs for observing and monitoring seepage
- Repairs to embankments and appurtenant structures
- Programs for operation, maintenance and inspection

Eugene O'Brien, P.E.
New York No. 29823

This Phase I Inspection Report on Ashmere Lake Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

Charles G. Tiersch

CHARLES G. TIERSCH, Chairman
Chief, Foundation and Materials Branch
Engineering Division

Fred J. Ravens Jr

FRED J. RAVENS, Jr., Member
Chief, Design Branch
Engineering Division

Saul Cooper

SAUL COOPER, Member
Chief, Water Control Branch
Engineering Division

APPROVAL RECOMMENDED:

Joe B. Fryar

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

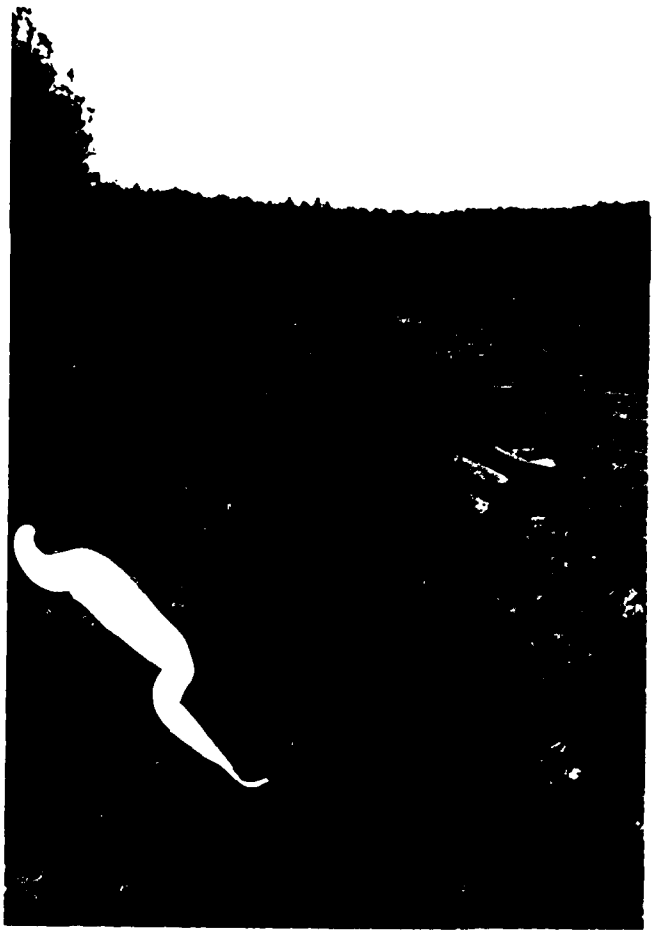
It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

HOUSATONIC RIVER BASIN
ASHMERE LAKE DAM
INVENTORY NO. MA 00223
PHASE I INSPECTION REPORT

CONTENTS

(1A) WEST LEG OF EMBANKMENT (Looking West)



(1B) EAST LEG OF EMBANKMENT (Looking West)

GENERAL OVERVIEW OF DAM

SECTION 4 - OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

Operational procedures for the project are not formally established but are based on the experience of the operating personnel.

4.2 MAINTENANCE OF DAM

There is no formal maintenance manual for the project. Maintenance is carried out as needed. Important features such as the gate valve are repaired immediately, mowing and cutting of vegetation is done when time allows. There is no scheduled program of inspection by the Forest and Parks personnel, however, there is a statewide program of inspection established several years ago by the Department of Environmental Quality Engineering, Division of Waterways. A copy of their last inspection report, dated 27 October 1975, is given in the Appendix. Prior to this, the County of Berkshire conducted inspections, a copy of their last report, dated 10 October 1968 is also given in the Appendix. Included in the Appendix, for historical purposes only, is a letter inspection report of 5 August 1907 submitted by the Division Engineer, Massachusetts Highway Commission.

4.3 MAINTENANCE OF OPERATING FACILITIES

There is no established maintenance program for the operating facilities. Maintenance is carried out as needed.

4.4 WARNING SYSTEMS IN EFFECT

There is no warning system in effect nor one planned.

4.5 EVALUATION

The maintenance and operating procedures for the dam and appurtenant structures are, in some respects, deficient. Measures to improve these deficiencies are given in Section 7.

The spillway channel which is overgrown with low vegetation in the vicinity of the training walls becomes totally overgrown and blocked by debris further downstream. This channel converges with the low level outlet channel several hundred feet downstream.

f. Reservoir Area

In the vicinity of the dam there is no evidence of sloughing, potentially unstable slopes or other unusual conditions which would adversely affect the dam. The bridge crossings along Highway 143 will not cause any adverse affects because they apparently do not constrict flows between the two sections of the lake.

3.2 EVALUATION OF OBSERVATIONS

Visual observations made during the course of the investigation revealed several deficiencies which at present do not adversely affect the adequacy of the dam. However, these deficiencies do require attention and should be corrected before further deterioration leads to a hazardous condition. Recommended measures to improve these conditions are given in Section 7.

There is evidence of minor seepage along the toe of the embankment at several low lying locations. This is a condition which appears to have existed for some time as evidenced by the presence of limonitic staining and fluorescence on the seepage water surface. In addition there is a general dampness along the entire toe, however, this is probably due to runoff caused by the rainfall of the previous evening. (See Photograph Nos. 13 & 14).

c. Appurtenant Structures

The low level outlet pipe at the outfall end appears to be rusted but in good condition. The stone masonry head and wing walls of the outlet structure appear to be in fair condition with some loose and missing mortar. At the end of the east wing wall there is minor erosion of the wall foundation. The floor of the structure is in good condition with only minimal erosion. (See Photograph No. 5).

The low level gate valve operating stand is rusty but operable. The mechanism is chained and padlocked to prevent unauthorized operation. (See Photograph No. 4). The gatehouse was destroyed in a fire 10 March 1977. The gate valve stem is located within a circular shaft of cemented brick and stone. It is reported that the shaft is in need of repairs. The top of the shaft is covered by nailed wooden planking.

The stone masonry spillway sill appears in good condition but some of the mortar pointing is loose or missing. The top surface of the sill is only partially visible because of heavy vegetation. (See Photograph No. 9). Upstream of the sill, the approach channel is completely silted and overgrown with vegetation. Downstream of the sill, the spillway channel is filled to the spillway crest with cobbles and boulders, and heavy growth covers the area. (See Photograph No. 10). The stone of the training walls is in good condition, except that the mortar pointing is generally missing.

Minor seepage was noted in the center of the spillway channel about 40 feet downstream and about 4 feet below the sill.

d. Abutments

There were no signs of seepage or other unusual conditions at the abutments. There was some dampness probably caused by surface runoff.

e. Downstream Channel

There are effectively two downstream channels; from the low level outlet and from the spillway. The channel from the low level outlet, is a natural channel which is almost totally blocked by debris. (See Photograph No. 6). The discharges from the outlet have created a secondary channel which is clear, and converges with the primary channel downstream of the blockage. (See Photograph No. 7).

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General

A visual inspection of Ashmere Lake Dam was made on 22 June, 1978. The weather was sunny, temperature between 75° and 80°F. The last rainfall, a heavy thunderstorm of about four hours duration occurred the night before. At the time of the inspection, the lake level was about 12 inches below the spillway crest.

b. Embankment

The earth embankment appears to be in generally good conditions. The horizontal and vertical alignments of the crest are good with only minor rutting caused by vehicular traffic occurring near the west abutment. (See Photograph No. 2).

The downstream slope does not show any erosion, sloughing or signs of trespassing. The slope is completely covered with heavy ground cover, seedlings and shrubs. (See Photograph No. 3). It appears that this slope has not been mowed within the past year or two. It is reported that a more frequent cutting schedule is not followed because the steepness of the slope makes it inconvenient for hand mowing and slope mowers are awkward to handle and tie up equipment needed elsewhere.

The upstream slope does not exhibit any sloughing or signs of trespassing, but there are some areas which have been eroded at the water line. Most of the erosion occurs along the east leg of the embankment where displacements of the riprap, some as large as 2.5 feet, were observed. (See Photograph No. 12). Wave action, which seems to occur more intensely on this leg of the embankment, appears to be washing out material from under the riprap and causes the large displacements.

In addition to the erosion, there is a general vertical displacement of about 6 inches in the riprap zone above the water line and is most apparent along the east leg of the embankment. (See Photograph No. 8). In addition, all riprap above the water line has vegetation growing between the stones. It is reported that the vegetation is cut frequently. There are a few young saplings along the waterline which have not been cut.

The above mentioned wave action appears to have created, by siltation, a widening of the crest in the area adjacent to the west spillway approach wall. (See Photograph No. 4). This silted area has covered the riprap both above and below the water line.

c. Validity

In general, the information obtained from the conceptual drawing and the personal interviews, with exceptions noted above in Section 2.1, is consistent with observations made during the inspection and therefore considered reliable.

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

Design data and specific memoranda are not available for the original construction of the dam. There is one drawing showing survey data for the reservoir and embankment. (See Appendix). The cross section of the dam shown on the drawing is not in accordance with the existing conditions. The location of the low level gate valve is not where shown, there is no service bridge, and the low level pipe is smaller, 24-inch rather than 36-inch diameter.

There is no information available on subsurface conditions.

2.2 CONSTRUCTION RECORDS

There are no construction records available.

2.3 OPERATION RECORDS

The operation of the low level gate valve are recorded and readings of the lake level are taken on a regular basis, about 2 to 4 times a week. These records are kept at the Regional Office of the Forest and Parks Department.

No records are kept of the rainfall at the dam site.

2.4 EVALUATION OF DATA

a. Availability

Existing information was made available by Department of Environmental Quality Engineering, Division of Waterways, Boston, Mass; District No. 1 Office, Department of Public Works, Executive Office of Transportation and Construction; Regional Office, Department of Forest and Parks, Pittsfield, Mass; and Crane and Company, Dalton, Mass.

b. Adequacy

The lack of in-depth engineering data did not allow for a definitive review. Therefore the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, past performance history and sound engineering judgment.

Downstream channel	Same as Upstream channel; beyond training walls flows are in natural channel into Bennett Brook

j. Regulating Outlets

The regulating outlets consist of an uncontrolled spillway and a 24 inch inside diameter cast iron low level outlet.

The spillway is 75 feet long, 3.5 feet below the top of the training walls and with a crest width of 2.5 feet at El 1578.

The low level outlet pipe is 144 feet long with the invert at the outlet end estimated at El 1549. Discharges into Bennett Brook are controlled by a manually operated valve located on the crest of the dam. The gate valve is operable.

e. Storage (acre-feet)

Recreation pool	2435 (est.)
Flood control pool	Not Applicable
Design surcharge	Unknown
Test Flood surcharge	2017
Top of dam	3220

f. Reservoir Surface (acres)

Top of dam	264.4
Test Flood pool	375
Flood-control pool	Not Applicable
Recreation pool	184
Spillway crest	184

g. Dam

Type	Earth
Length	1574 feet
Height	32.5 feet
Top width	15 feet
Side Slopes - Upstream	1 (V): 3 (H)
- Downstream	1 (V): 2 (H)
Zoning	Unknown
Impervious core	4 and 16 feet top and base width respectively 4 feet below crest; puddled (according to available drawing)
Cutoff	Unknown
Grout curtain	Unknown
Other	None

h. Diversion and Regulating Tunnel

Type	Not Applicable
Length	Not Applicable
Closure	Not Applicable
Access	Not Applicable
Regulating facilities	Not Applicable

i. Spillway

Type	Broad-crested
Length of weir	75.0 feet
Crest elevation, feet	1578.0
Gates	None
Upstream channel	75 feet wide; 30 feet long; flanked by stone masonry training walls

wood forests, and is drained by two small streams in the southeastern section, with a combined drainage area of about 1.92 square miles. The remaining 52 percent of the basin has no defined channels. The surface area of the lake, at spillway crest (184 acres), is about 7% of the total drainage area.

b. Discharges at Damsite

Discharges at the damsite are over a stone masonry spillway and through a low level outlet.

The spillway is 75 feet wide, 3.5 feet high with a 2.5 feet wide sill at about El 1578. The computed maximum discharge, at a head of 3.5 feet is 1,570 cfs.

The low level outlet is a 24-inch inside diameter cast iron pipe, 144 feet long, with the invert at the outlet end estimated at El 1549. The invert elevation of the inlet end is unknown. The computed maximum discharge from the pipe, with a head equivalent to the crest edge (El 1581.5) is 80 cfs.

There is no record of the maximum flood at the damsite but reportedly the dam has never been overtopped during a major flood.

c. Elevation (ft. above MSL)

Top of dam	1581.5± (crest edge): 1583 ± (crest centerline)
Maximum pool-design surcharge	Unknown
Maximum pool-test flood	1586
Full flood control pool	Not Applicable
Recreation pool	1578±
Spillway crest (gated)	Not Applicable
Upstream portal invert diversion tunnel	Not Applicable
Downstream portal invert diversion tunnel	Not Applicable
Streambed at centerline of dam	1549±
Maximum tailwater	Unknown

d. Reservoir (feet)

Length of maximum pool	8000±
Length of recreation pool	8000±
Length of flood control pool	Not Applicable

f. Normal Operating Procedures

The normal operating procedure is to keep the lake level about 12 and 60 inches below the spillway crest during the summer and winter months, respectively. The lake level is never lowered to more than 60 inches below the spillway crest because doing so would dry up local wells. The levels are monitored from a gage mark located on the eastern bridge which crosses the north end of the lake.

g. Size Classification

The dam is less than 40 feet high but has a storage capacity of more than 1000 acre-feet, therefore, it is classified as an "intermediate" dam.

h. Hazard Classification

The dam is in a "high" hazard potential category because 1.5 to 2 miles downstream from the dam along Middlefield Road there are about 10 homes. In the event of a failure, the resulting flood wave could cause substantial loss of life and property.

For details on the selection of the hazard potential category see Section 5.6.

i. Operator

The persons responsible for the day-to-day operation of the dam are:

1. Mr. Douglas Poland
   Supervisor, Regional Forest and Park Department
   Washington, Massachusetts
   Phone: (Home) 413-623-8348
   (Office) 413-442-8992

2. Mr. Carl Curtin
   Assistant Supervisor, Regional Forest and Park Dept.
   Margerie Street
   Lee, Massachusetts 01238
   Phone: (Home) 413-243-1820
   (Office) 413-442-8992

1.3 PERTINENT DATA

a. Drainage Area

The total drainage area contributing to Ashmere Lake is 4 square miles and is located in the headwaters of the East Branch of the Housatonic River. The basin is covered mainly by well-established hard-

mately 1 foot, and is "dog-legged" at an angle of about 138°. The length of the east and west legs of the embankment are about 710 and 864 feet, respectively. The upstream and downstream slopes of the dam which are covered with vegetation are 1 (V): 3 (H) and 1 (V): 2 (H), respectively. The upstream slope is protected by riprap to within 4 feet of the crest's edge. According to an available drawing, the dam was designed having a puddled core. The core is shown to be 4 feet wide at the top, 16 feet wide at the base and terminating 4 feet below the crest.

A 24-inch inside diameter cast iron pipe which serves as a low level outlet is located at the base of the dam at the maximum section. Discharges from the pipe are controlled by a manually-operated gate valve located on the crest of the dam. At the downstream terminus of the pipe there is a 7.5 feet high stone masonry headwall which is flanked on each side by a stepped stone masonry wing wall. The height, length and thickness of the wing wall are 6.5, 12 and 3.5 feet, respectively. The wing walls flare from 4 feet at the pipe to 5 feet at the end of the wall. The floor of the channel near the outlet structure is covered with large stones.

A stone masonry spillway, 75 ft by 3.5 ft, is located at the east abutment and flanked on each side by a stone masonry training wall. Each wall is 60 feet long, 2.5 feet thick and at the spillway sill, 3.5 feet high. The spillway sill is situated midway along the walls.

b. Location

The dam is located about 2 miles east of the Town of Hinsdale. Massachusetts Route 143 crosses the north end of the lake at two bridge locations. The lake is fed by two unnamed brooks located at the north end of the lake. The outflow from the lake, is carried by Bennett Brook to the East Branch of the Housatonic River.

c. Ownership

Ashmere Lake Dam is owned by the Commonwealth of Massachusetts, Department of Environmental Management. The day-to-day operation and maintenance is managed by the Department of Forest and Parks.

d. Purpose of Dam

The impoundment provided by the dam is for recreational purposes.

e. Design and Construction History

Original design and construction records are not available. It is reported that the dam was built in about 1875 for Crane and Company for use in paper manufacturing. There are no records of any alterations to the dam. It should be noted that the dam was not built as originally designed. This can be seen from study of a copy of an original drawing showing the cross section of the dam (See Appendix).

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM
HOUSATONIC RIVER BASIN
INVENTORY NO. MA 00223
ASHMERE LAKE DAM
TOWN OF HINSDALE
BERKSHIRE COUNTY, COMMONWEALTH OF MASSACHUSETTS

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a national program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of the dams within the New England Region. Tippetts-Abbett-McCarthy-Stratton has been retained by the New England Division to inspect and report on selected dams in the State of Massachusetts. Authorization and notice to proceed was issued to Tippetts-Abbett-McCarthy-Stratton under a letter of May 3, 1978, from Mr. Ralph T. Garver, Colonel, Corps of Engineers. Contract No. DACW 33-78-C-0298 has been assigned by the Corps of Engineers for this work.

b. Purpose

(1) Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.

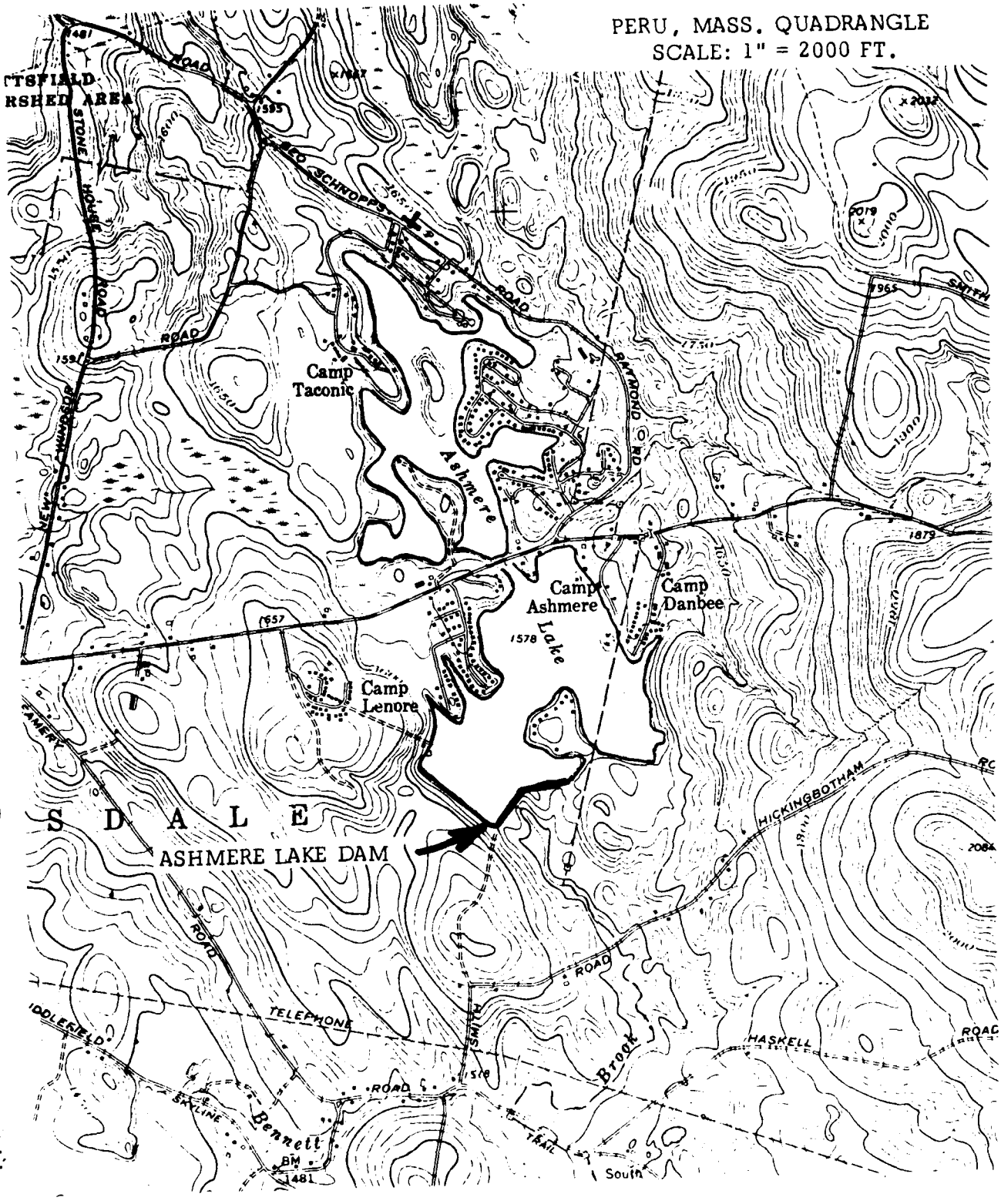
(2) Encourage and prepare the States to initiate quickly effective dam safety programs for non-Federal dams.

(3) To update, verify and complete the National Inventory of Dams.

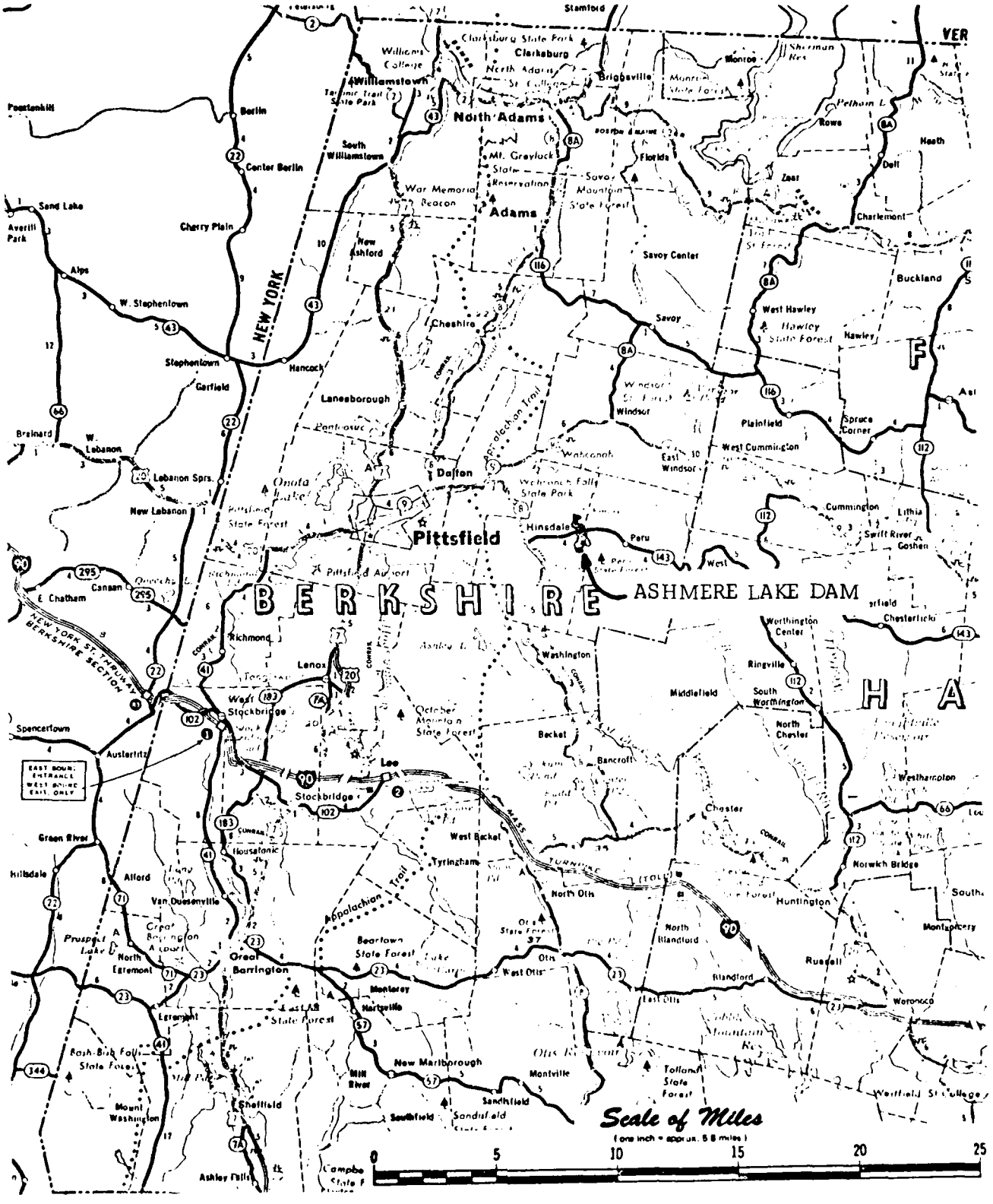
1.2 DESCRIPTION OF THE PROJECT

a. Description of the Dam & Appurtenances

Ashmere Lake Dam is an earth embankment 1574 feet long with a maximum height of 32.5 feet. The crest is 15 feet wide, crowned approxi-



TOPOGRAPHIC MAP
ASHMERE LAKE DAM



VICINITY MAP
ASHMERE LAKE DAM

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 DRAINAGE AREA CHARACTERISTICS

The total drainage area contributing to Ashmere Lake is 4 square miles and is located in the headwaters of the East Branch of the Housatonic River. The basin is mainly covered by well-established hardwood forests, and it is drained by two small streams in the southeastern section, with a combined drainage area of about 1.92 square miles. The remaining 52 percent of the basin has no defined channels. The surface area of the lake, at spillway crest (184 acres), is about 7% of the total drainage area.

5.2 SPILLWAY CAPACITY

The spillway is uncontrolled 75.0 feet wide, with a flat masonry sill, 2.5 feet in width. The channels upstream and downstream of the sill are heavily overgrown with shrubs. The spillway is bordered by two training walls which are 3.5 feet higher than the sill. No head-discharge relation was available, therefore, it was necessary to estimate the discharge characteristics. It was assumed that the spillway would act as a broad-crested weir and the estimated maximum capacity, at a head of 3.5 feet, equivalent to the top of the training walls, is 1,570 cfs.

5.3 RESERVOIR CAPACITY

The maximum capacity of Ashmere Lake is 3,220 acre-feet, which includes a surcharge storage between El 1578 and El 1581.5 estimated to be 785 acre-feet. This surcharge storage is equivalent to 3.7 inches of runoff over the drainage area.

5.4 FLOODS OF RECORD

No flood records are available. The greatest flood peak discharges on the East Branch of the Housatonic River (drainage area, 57.1 square miles) were 6,000 cfs on March 21, 1936; 6,400 cfs on September 21, 1938; and 5,700 cfs on December 31, 1948.

5.5 DESIGN FLOOD

Because there are no data on Probable Maximum Floods (PMF) for an area of 4 square miles, it was necessary to synthesize a test flood hydrograph for the contributing area. Initially, a depth-duration relation for the maximum probable point rainfall (10 square mile area), for durations

from 6 to 24 hours was taken from U.S. Weather Bureau Sources.[1] The distribution of the rainfall was based on data in a publication of the World Meteorological Organization.[2] Increments of depth from the depth-duration relation, at 15 minute intervals, were arranged in the probable storm sequence as shown in the Appendix.

The drainage area was divided into four sub-basins as follows:

The lake sub-basin of 184 acres, with no incremental losses and no lag time, the unchanneled sub-basin of 1,147 acres, with a lag of one hour and an assumed infiltration loss of 0.2 inches per hour, and the two stream sub-basins of about 615 acres each, a lag time of 0.36 hours and 0.2 inches per hour infiltration loss. A test flood, equal to the Probable Maximum Flood (PMF) was derived by summing the Probable Maximum Flood hydrographs from each sub-basin as shown in the Appendix. The total PMF inflow-peak was 13,970 cfs, with a runoff volume equivalent to 15.66 inches in 6 hours.

5.6 OVERTOPPING POTENTIAL

The adequacy of the spillway was tested by routing the PMF through the reservoir using a computerized routing technique. The water surface was assumed to be at the spillway crest at the start of the storm. The peak outflow from the routed test flood (PMF) was 5,770 cfs at a head of 9.26 feet (El 1586.26 or 4.76 feet above the top of the training walls).

In order to estimate the downstream dam failure hydrograph, the U.S. Corps of Engineers "Rule of Thumb" guidance was used. The estimate assumes: (a) the reservoir surface is at the top of the dam at the time of the breach, (b) a breach of 40% of the dam length occurs (639.6 feet) and (c) the channel has an average roughness coefficient (n) of 0.07. It is estimated that at a selected section, 8,000 feet downstream of the dam, the peak flood wave discharge is 103,150 cfs with a wave height of about 32 feet. The visual inspection corroborates the information shown on the U.S.G.S. Quadrangle sheet for Peru, Mass. which indicates, at this section, about 10 houses between El 1485 and El 1516. These houses would probably be destroyed or damaged by the estimated flood wave.

1/ Seasonal Variation of the Probable Maximum Precipitation East of the 105° Meridian for areas from 10 to 1,000 Square miles and Durations of 6, 12, 24 and 48 hours, Hydrometerological Report No. 33, 1956.

2/ Manual for Estimation of Probable Maximum Precipitation, World Meteorological Organization, Operational Hydrology Report No. 1973.

5.7 EVALUATION

Since the dam is expected to be overtopped by about 4.8 feet with an inflow equal to the PMF (spillway capacity is 30% of peak outflow), it is considered that the spillway is inadequate from a hydraulic and hydrologic standpoint. It should be pointed out, however, that the dam supposedly has not been overtopped in about 100 years and has been adequate against the major floods in the region of 1936, 1938 and 1955. The flood used to test the adequacy of the spillway assumes that a 6-hour point rainfall, equivalent to twice the 100-year, 6-hour rainfall, will be centered over a 4 square mile area.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

Visual observations did not indicate any serious structural problems with the embankment, spillway or low level outlet. The deficiencies described in Section 3 require attention and measures to improve these deficiencies are given in Section 7.

b. Design and Construction Data

No design computations or other data pertaining to the structural stability of the dam have been located.

On the basis of the performance experience, the visual inspection, as well as engineering judgment, the dam at present appears to be structurally adequate.

c. Operating Records

There are operating records available at the District Office of the Forest and Parks Department. There was only one operating problem noted; in February 1978 there was difficulty in operating the 24-inch gate valve. It was immediately repaired. There are no other records or reports of operational problems which would affect the stability of the dam.

d. Post-Construction Changes

It is reported the dam was built sometime around 1875. There are no records of any construction changes even though "as built" conditions vary from the drawing shown in the Appendix.

e. Seismic Stability

The dam is located in Seismic Zone No. 2 and in accordance with recommended Phase I guidelines does not warrant seismic analyses.

SECTION 7 - ASSESSMENT, RECOMMENDATIONS & REMEDIAL MEASURES

7.1 DAM ASSESSMENT

a. Conditions

Phase I investigation of Ashmere Lake Dam does not indicate conditions which would constitute an immediate hazard to human life or property. Based on engineering judgment and the performance of the earth embankment and outlet works, the project appears to be in good condition. The project however, does have inadequacies and deficiencies which, if not remedied, have the potential for developing into hazardous conditions.

Because there are no data on Probable Maximum Floods (PMF) for an area of 4 square miles, it was necessary to synthesize a test flood hydrograph for the contributing area. The drainage area was divided into four sub-basins and a test storm, equal to the Probable Maximum Flood (PMF) was derived by summing the Probable Maximum Flood hydrographs from each sub-basin. The PMF inflow-peak was 13,970 cfs, with a runoff volume equivalent to 15.56 inches in 6 hours.

The adequacy of the spillway was tested by routing the flood through the reservoir using a computerized routing technique. The water surface was assumed to be at the spillway crest at the start of the storm. The peak outflow from the routed flood (PMF) was 5,170 cfs at a head of 9.26 feet (El 1586.26 or about 4.76 feet above the crest edge and training walls).

Since the dam is expected to be overtopped with an inflow equal to the PMF, it is considered that the spillway is not adequate from a hydraulic and hydrologic standpoint. It should be pointed out however, that the dam supposedly has not been overtopped in about 100 years and has been adequate against the major floods in the region in 1936, 1938 and 1955. The design flood used to test the adequacy of the spillway assumes that a 6-hour rainfall, equivalent to twice the 100 year, 6-hour rainfall, will be centered over a 4 square mile area.

b. Adequacy of Information

The lack of in-depth engineering data did not allow for a definitive review. Therefore the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, past performance history and sound engineering judgment.

c. Urgency

The recommendations and remedial measures described in subsequent paragraphs should be undertaken by the owner within the next 12 to 24 months, after receipt of this Phase I Inspection Report.

d. Necessity for Additional Investigations

Additional investigations to assess the adequacy of the dam and appurtenant structures appear necessary and are enumerated in the following paragraph.

7.2 RECOMMENDATIONS

It is recommended that the following measures be undertaken by the owner within 12 months after receipt of this Phase I Inspection Report:

1. A competent consulting engineer should be retained to conduct further hydraulic studies to determine what measures are necessary to improve discharge capacities.
2. A survey should be performed of the dam crest to locate low points which should then be filled to a required elevation with appropriate material.
3. Erosion areas along the upstream slope should be refilled and the riprap rebuilt on appropriate bedding material.
4. To remove runoff more efficiently, consideration should be given to construction of toe drains.

7.3 REMEDIAL MEASURES

a. Alternatives

The results of the additional investigations recommended above may indicate alternatives which will be needed to provide discharge adequacy under flood conditions. These alternatives can only be determined after the completion and evaluation of the additional investigations.

b. Operating & Maintenance Procedures

It is recommended that the following measures be undertaken by the owner within the next 24 months.

1. Establish a systematic program of observation and monitoring of changes in pattern and quantity of seepage. Observations can be accomplished by the installation of piezometers.
2. After removal of vegetation from riprap, a monitoring system should be established to determine whether the riprap above the water line is still settling.

3. Establish a formal program or operation and maintenance and initiate biannual inspections of the dam.
4. The owner should provide round the clock surveillance during periods of unusually heavy precipitation.
5. The owner should develop a formal system for warning downstream residents in case of emergency.
6. All vegetation on both slopes should be kept in a close cut condition.
7. All brush, shrubs, and young saplings should be removed from the spillway channel and the area immediately downstream of the embankment toe. In the area downstream of the toe, large conifers, but not deciduous hardwoods, should be removed and the remaining trees should be inventoried and their condition monitored. If a tree dies, the area around the tree should be closely monitored for seepage.
8. All masonry walls should be repointed.
9. Debris and overhanging trees should be removed and hauled away from all downstream channels.
10. Gatehouse should be replaced as soon as possible and gate operating mechanism greased and painted.
11. The low level valve access shaft should be repaired and a more secure decking be installed.
12. Crest rutting should be filled to grade and seeded. Measures should be taken to prevent unnecessary traffic on crest.

VISUAL INSPECTION CHECK LIST

APPENDIX A

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT ASHMERE LAKE DAM

DATE 6-22-78

TIME 10.00 AM

WEATHER Sunny 75°-80°

W.S. ELEV. 1577 ± * U.S.

PARTY:

1. Harvey S Feldman
2. Jyotindra H Patel
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

PROJECT FEATURE	INSPECTED BY	REMARKS
1. All project features inspected by party members.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

* Lake level taken from USGS topographic sheet which indicates EL. 1578. It is assumed that this elevation is also of spillway sill. The water level in gauging point at Route 143 Crossing lake, was 12" below this level at time of inspection. All elevation noted refers to this elevation.

PERIODIC INSPECTION CHECK LIST

OJECT ASHMERE LAKE DAM DATE 6-22-78

OJECT FEATURE _____ NAME _____

SCIPLINE _____ NAME _____

AM EMBANKMENT

'est Elevation 1583 ±

urrent Pool Elevation 1577 ± (See Note on front page of check list)

axiмum Impoundment to Date _____

urface Cracks None observed

avement Condition No pavement at crest.

lovement or Settlement of Crest None observed

ateral Movement None observed

ertical Alignment Generally good except slight rutting on west end of crest.

orizontal Alignment Generally Good

ondition at Abutment and at Concrete Structures Heavy vegetation at Abutment. Surface runoff at contact betw. Abutment and Embankment

ndications of Movement of Structural Items on Slopes None observed

respassing on Slopes None

loughing or Erosion of Slopes or Abutments Erosion at several locations on upstream slope due to wave action.

ock Slope Protection - Riprap Failures Upstream slope Riprap disturbed by wave action; Eastern leg of upstream slope riprap have settled 6" ± zone from waterline to top of Riprap; and Riprap completely covered with vegetation

Inusual Movement or Cracking at or near Toes None observed, however there is heavy vegetation.

Inusual Embankment or Downstream Seepage In low lying areas there is evidence of wet areas at Downstream slope and toe. Some of these areas are seepages and other areas could be seepage are due to previous evening run off.

ng or Boils None observed

ndation Drainage Features None

Drains None

trumentation System None.

scellaneous Downstream slope have been recently mowed
r short distance from crest edge. It appears that remainder
f downstream slope has not been cut some time (about 2 years)
pstream slope recently mowed upto water line, however there
are some growing saplings at water line.

PERIODIC INSPECTION CHECK LIST

PROJECT _____ DATE _____

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE None

a. Approach Channel

Slope Conditions _____

_____

Bottom Conditions _____

_____

Rock Slides or Falls _____

_____

Log Boom _____

_____

Debris _____

_____

Condition of Concrete Lining _____

_____

Drains or Weep Holes _____

_____

b. Intake Structure

Condition of Concrete _____

_____

Stop Logs and Slots _____

_____

PERIODIC INSPECTION CHECK LIST

OJECT ASHMERE LAKE DAM DATE 6-22-78

OJECT FEATURE _____ NAME _____

SCIPLINE _____ NAME _____

UTLET WORKS - CONTROL TOWER
Masonry Valve Shaft
~~Concrete Inlet Structure~~

Controls for low level outlet was in a wooden gate house. The gate house was demolished in fire in March 1977. The gate house located at crest and highest embankment height.

General Condition fair

Condition of Joints fair and some pointing missing at joints.

Spalling _____

Visible Reinforcing _____

Rusting or Staining of Concrete _____

Any Seepage or Efflorescence _____

Joint Alignment _____

Unusual Seepage or Leaks in Gate Chamber Not accessible, therefore not determined

Cracks _____

Rusting or Corrosion of Steel Some rusting is reported

Mechanical and Electrical None

Air Vents _____

Float Wells _____

Crane Hoist _____

Elevator _____

Hydraulic System _____

_____

Service Gates _____

_____

Emergency Gates _____

_____

Lightning Protection System _____

_____

Emergency Power System _____

_____

Wiring and Lighting System _____

_____

24" Gate Valve operated from crest of dam manually.

PHOTOGRAPHS

APPENDIX C

F. H JOYNER
DIVISION ENGINEER
MASSACHUSETTS HIGHWAY COMMISSION
PITTSFIELD, MASS.

2

seen that would indicate that the dams have changed any since they nstructed. The cross-section of both dams is some larger considered necessary by authorities on earth dams, and as they en erected a sufficiently long time for the development of any s from faulty construction, and as no such weakness can be discov- believe they can be considered safe.

The spillways for both dams are of good size and in good con- The one at Ashmere reservoir is slightly out of level thereby g the overflow towards the dam abutment and possibly along the lope of the dam. No sign of any wear or abrasion can be seen on or slope but it might be well to have the spillway wall extended 0 feet as a precautionary measure.

This inspecting and reporting on dams with no knowledge of the followed in their construction is rather unsatisfactory, yet, as said before, I believe the three dams are safe.

When the dams were inspected the Windsor reservoir had been rawn off and the Plunkett and Ashmere reservoirs were nearly It might be well to have a further inspection made when the is full and the Ashmere and Plunkett low.

Yours respectfully,

F. H Joyner

F. H. JOYNER.
DIVISION ENGINEER.
MASSACHUSETTS HIGHWAY COMMISSION.
PITTSFIELD, MASS.

August 5, 1907.

rank H. Cande,

Clerk of County Commissioners.

Sir;-

In accordance with your written instructions of July 8th, and l instructions of an earlier date I have made an inspection of the at Windsor, Plunkett and Ashmere reservoirs, and report as follows.

Not having been present when either of the dams were erected of course impossible for me to report on more than their present nal appearance.

The Windsor reservoir dam is built in the form of an arch, of t rubble masonry apparently well laid and bonded. There are no of any weakness at any point, and as the dimensions of the dam are for the work required I see no reason why the dam should not be dered safe.

The Ashmere and Plunkett dams are built of earth, 15 feet in at top with slope of about 2 to 1 on inside and 1 1/2 to 1 on out-

The inner slope of both dams is faced with a good heavy rip-rap ed well above high water, and undoubtedly carried down to toe of , although this could not be seen through the water. All slopes ven and in good line, and excepting where rip-rapped, are well d. There are no signs of any leaks or other defects, and nothi

COUNTY OF BERKSHIRE, MASS.

INSPECTION OF DAMS

y or Town of Hinsdale Date October 10, 1968

me of Dam Ashmere Lake Inspector William A. Heaphy

rner Crane and Co. Address Dalton, Mass. Tel. 684-2600

retaker Robert E. Crouchwell Address 124 Crane Ave., Dalton, Mass. Tel. 684-0089

cation About 3 miles east of Hinsdale, at southeast end of reservoir

pe and Dimensions Earth embankment, about 1400' long, 30' to 40' high,
Face of dam riprapped

illway, type and size Stone sidewalls 75' long, riprapped waterway and vertical core wall of stone masonry 3.5' high

tlets, type and size 24" cast iron pipe and gate

shboards, type and height None

te Built about 1875 Condition Good

hen last repaired ---------- By whose orders

ture of Repairs ----------

rpose of Dam Formerly storage for manufacturing firms downstream

proximate storage of water about 200 acres

proximate area of water shed ----------

sible damage due to failure of dam To woods and farmlands, and possible some damage to town roads.

marks Water level 5.7' below spillway. Heavy growth on upstream and downstream slopes, and spillway section. Gate partially opened.

ommendations Remove growth on slopes, and repair masonry where pointing up.

BERKSHIRE COUNTY
MASSACHUSETTS

OF THE
RING DEPARTMENT
HOUSE
LD, MASS. 01201

WILLIAM A. HEAPHY,
COUNTY ENGINEER
ROBERT J. SAULNIER,
ASS'T. COUNTY ENGINEER

413-447-7156

June 15, 1978

19

Tippetts-Abett-McCarthy-Stratton
Engineers and Architects
345 Park Avenue
New York, New York 10022

Att'n: H. S. Feldman

Dear Sir:

Enclosed herewith is a copy of the latest dam reports that I have pertaining to Pontoosuc Lake in Pittsfield, Ashmere Lake in Hinsdale and Windsor Lake in North Adams. As you probably know, the Commonwealth of Massachusetts took over inspection of dams from the county about eight years ago.

Also, I am enclosing a print of the Pontoosuc Dam that we had in our files. There is also a copy of a report of inspection of dams made in 1907 by one Mr. Joyner of the Massachusetts Highway Commission, which includes Ashmere Lake. This report, which I realize is very old, may be of little value to you.

I have searched the records here but can find nothing further on the aforementioned dams.

Very truly yours,

William A. Heaphy

William A. Heaphy
County Engineer

WAH/dd

Enclosure

The Commonwealth of Massachusetts
Executive Office of Transportation and Construction
Department of Public Works
DISTRICT #1 OFFICE
VETERAN'S MEMORIAL HIGHWAY, LENOX
P. O. BOX 1151, PITTSFIELD 01201

June 14, 1978

SUBJECT Waterways - Dam Inspection Reports
Pittsfield - Pontoosuc Dam #1-2-236-9
Windsor - Dam #1-2-345-2
Hinsdale - Ashmere Lake Dam #1-2-132-1

Tippetts, Abbott, McCarthy, Stratton
345 Park Avenue
New York, N. Y. 100022

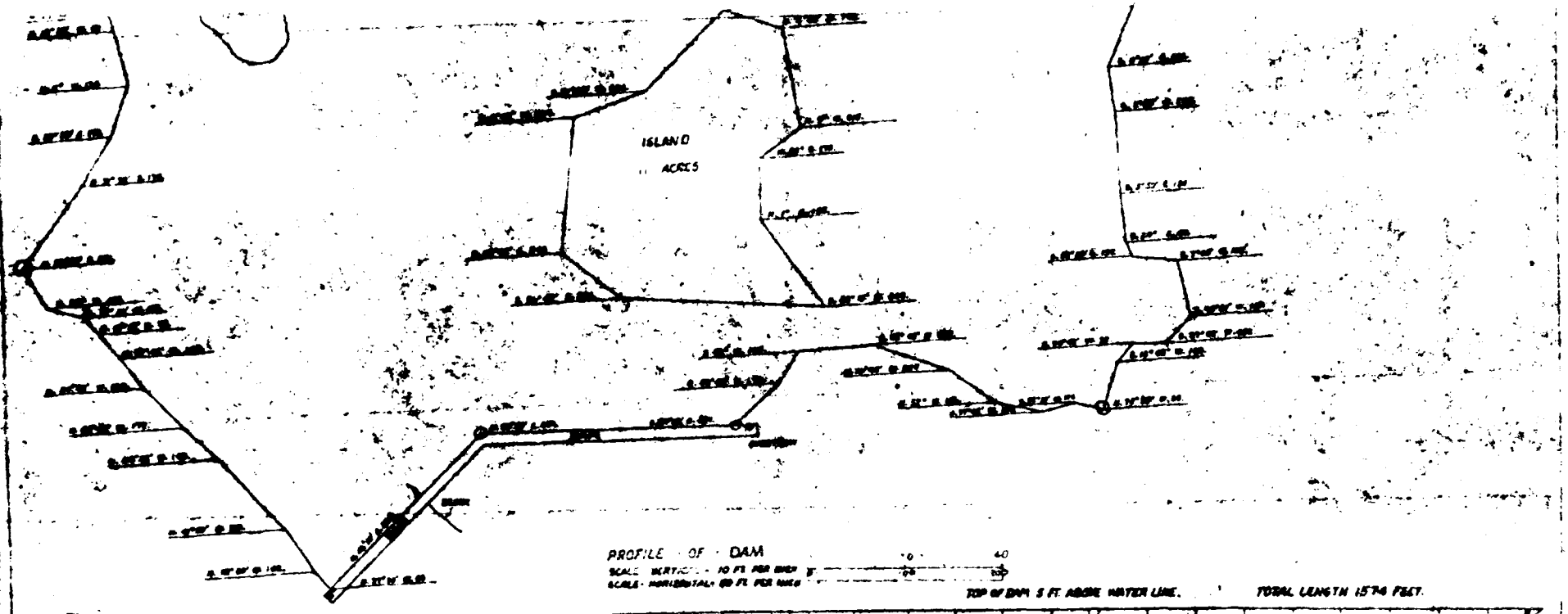
Gentlemen

Enclosed are copies of dam inspection reports for the above named dams. I have also enclosed sections of topographical maps showing their location which I think will be of some help to you.

Very truly yours

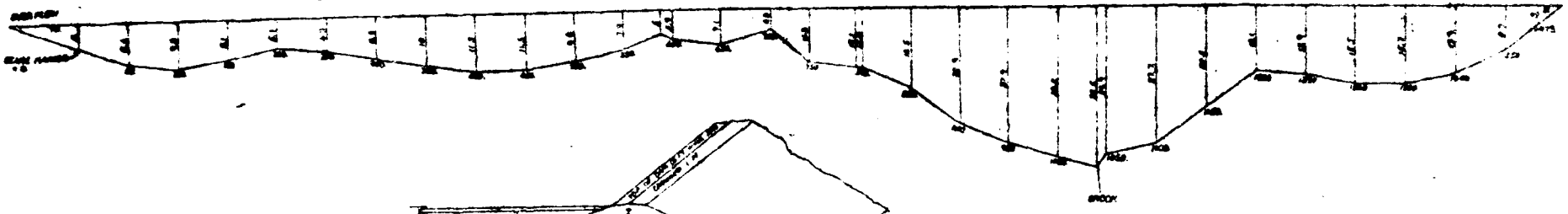
Dean P. Amidon, P. E.
District Highway Engineer

RBDrep
Enclosures
cc DamsLen



PROFILE OF DAM

TOP OF DAM 5 FT. ABOVE WATER LINE. TOTAL LENGTH 1574 FEET.



SECTION OF DAM AND GATE

NOTE

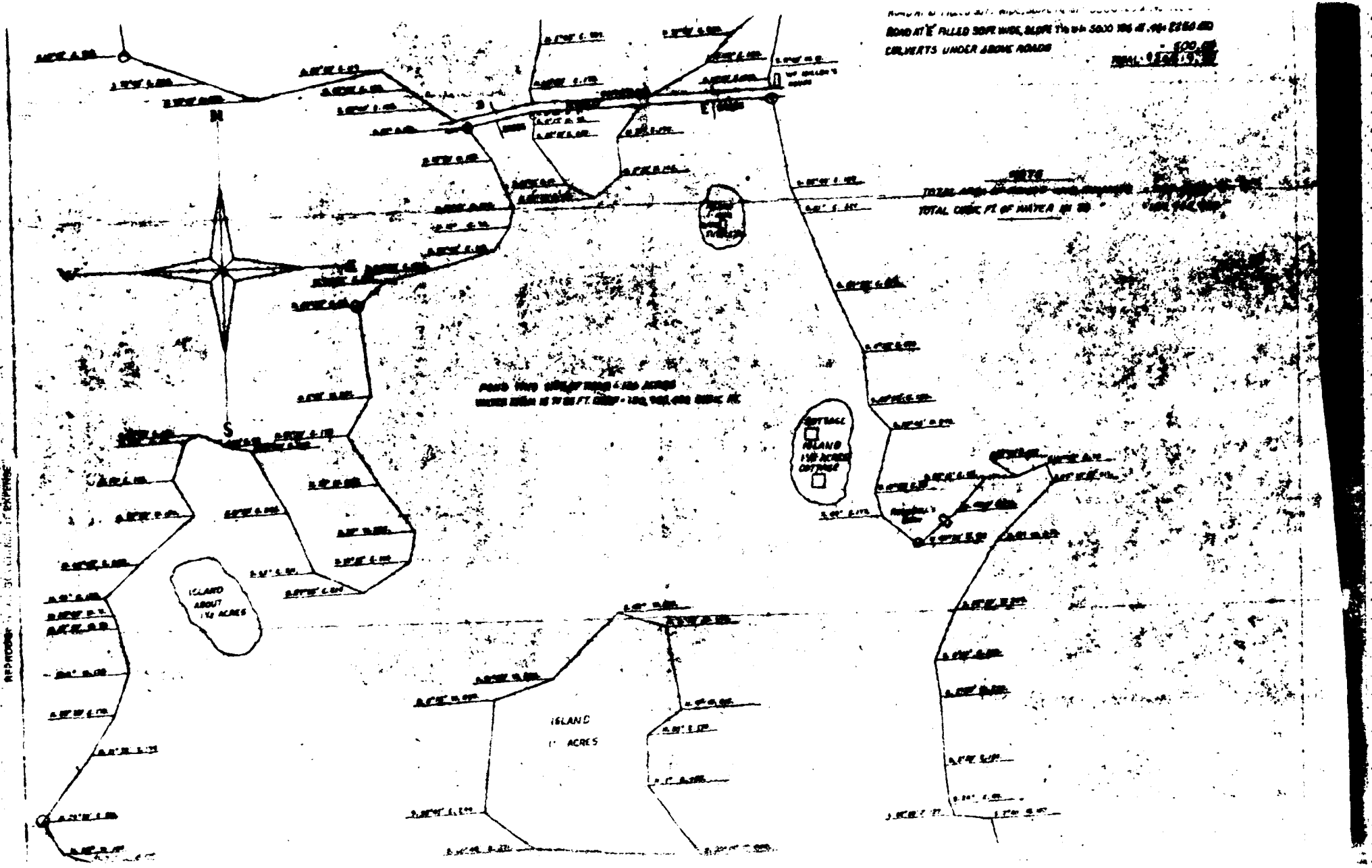
THIS TRACING IS MADE FROM THE ORIGINAL DRAWING ON FILE IN THE BEAUFORT COUNTY COMMISSIONER'S OFFICE.

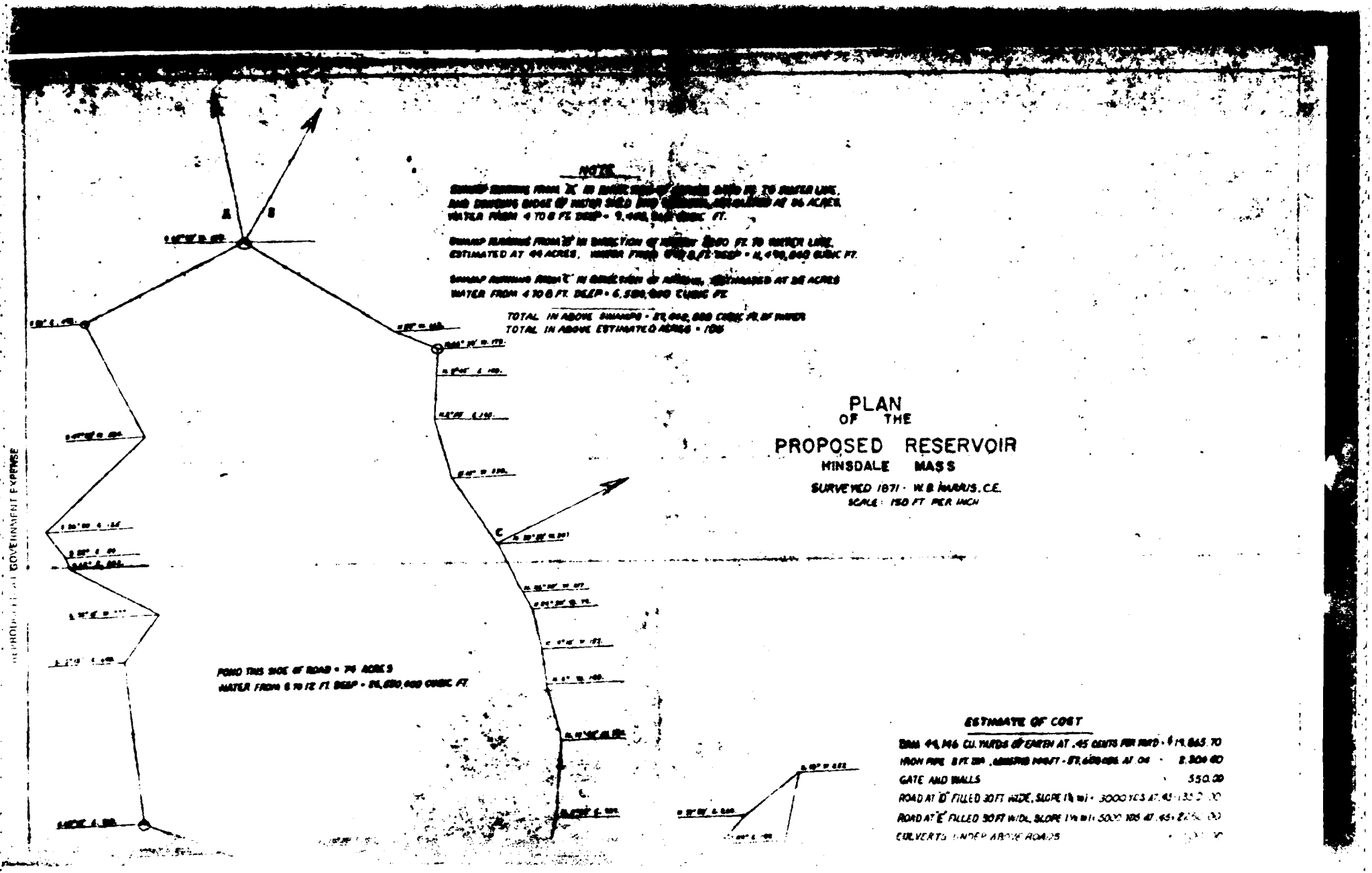
TRACED BY

CHECKED BY

COMPLIMENTS OF

BELOIT
JONES DIVISION


N
S
ISLAND
ABOUT
1½ ACRES
ISLAND
1½ ACRES
COTTAGE
ISLAND
1½ ACRES
COTTAGE


NOTE
A
B
C
POND THIS SIDE OF ROAD = 74 ACRES
WATER FROM 6 TO 12 FT. DEEP = 20,000,000 CUBIC FT.
PLAN
OF THE
PROPOSED RESERVOIR
HINSDALE MASS
SURVEYED 1871 - W.B. HARRIS, C.E.
SCALE: 150 FT PER INCH
ESTIMATE OF COST
IRON PIPE 8 FT DIA
GATE AND WALLS
550.00

DRAWINGS AND INSPECTION REPORTS

APPENDIX B

Floor of Channel Within zone of downstream headwalls, floor is of loose cobbles and boulders completely covered with silt and vegetation

Other Obstructions As noted above and minor debris

PERIODIC INSPECTION CHECK LIST

PROJECT ASHMERE LAKE DAM DATE 6-22-78

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS

a. Approach Channel

General Condition poor

Loose Rock Overhanging Channel None observed.

Trees Overhanging Channel None observed.

Floor of Approach Channel Completely overgrown with vegetation and siltation. Also minor debris

b. Weir and Training Walls

General Condition of ~~Concrete~~ Masonry Stones in Generally Good conditon and some mortar at joints loose and missing.

Rust or Staining ——

Spalling ——

Any Visible Reinforcing None

Any Seepage or Efflorescence Inside of spillway about 40 feet downstream of weir minor seepage flowing in downstream channel.

Drain Holes None

c. Discharge Channel

General Condition Extremely poor condition

Loose Rock Overhanging Channel None observed because of heavy vegetation

Trees Overhanging Channel Heavy tree growth about 20 feet of weir. In addition entire channel covered with thick vegetation make it impossible to inspect.

PERIODIC INSPECTION CHECK LIST

PROJECT ASHMERE LAKE DAM DATE 6-22-78

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL Masonry headwall and wingwall and floor

General Condition of ~~Concrete~~ Masonry Generally Fair to Good
Some mortor pointing loose and missing.

Rust or Staining _____

Spalling _____

Erosion or Cavitation _____

Visible Reinforcing _____

Any Seepage or Efflorescence None observed

Condition at Joints Some mortor loose and missing

Drain Holes None observed

Channel is a natural gravel cobble & boulder and divided two branches which converge downstream.

Loose Rock or Trees Overhanging Channel Heavy trees in and arround channel.

Condition of Discharge Channel one branch completely blocked by debris apparently second channel has been formed as natural diversion around blockage

PERIODIC INSPECTION CHECK LIST

PROJECT _____ DATE 6-22-78

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

OUTLET WORKS - TRANSITION AND CONDUIT 24 Inch Cast Iron Conduit.

General Condition of ~~Concrete~~ Due to inaccessibility condition of 24 inch cast iron conduit cannot be determined.

Rust or Staining of Concrete Some rusting observed at downstream outlet

Spalling —

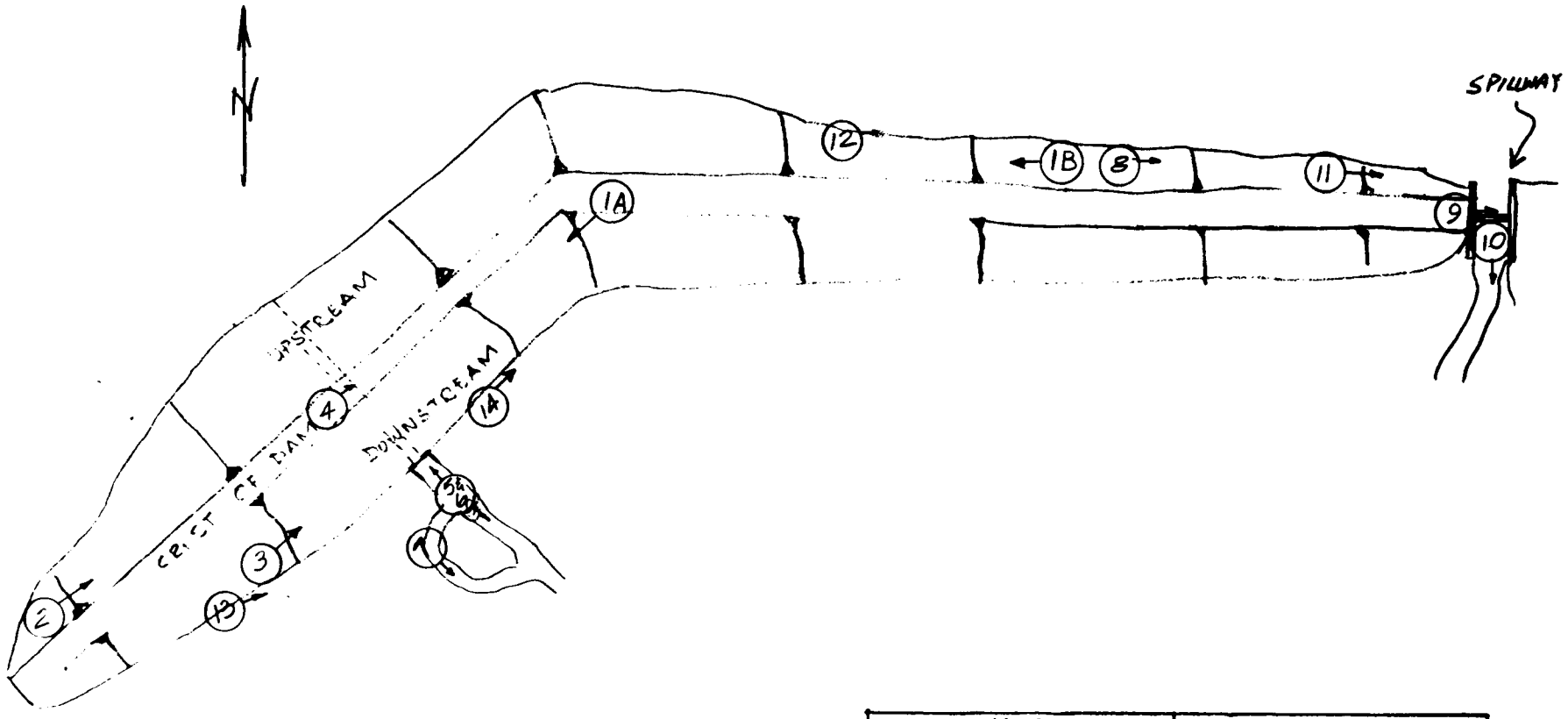
Erosion or Cavitation —

Cracking —

Alignment of Monoliths —

Alignment of Joints Can not be determined because of inaccessibility.

Numbering of Monoliths —



TAMS BROOKLINE MASS	US ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

ASHMERE LAKE DAM

PHOTOGRAPH LOCATION GUIDE

BENNETT BROOK MASS

SCALE	NTS
DATE	JULY 78

(2) CREST OF DAM NEAR WEST ABUTMENT,
NOTE RUTTING DUE TO TRAFFIC AND VEGETATION ON UPSTREAM RIPRAP

(3) VIEW OF DOWNSTREAM SLOPE (LOOKING EAST)
NOTE HEAVY TREE GROWTH AT TOE OF EMBANKMENT AND VEGETATION ON SLOPE

(4) GATE VALVE OPERATING MECHANISM FOR LOW LEVEL OUTLET AND FOUNDATION OF DESTROYED GATE HOUSE

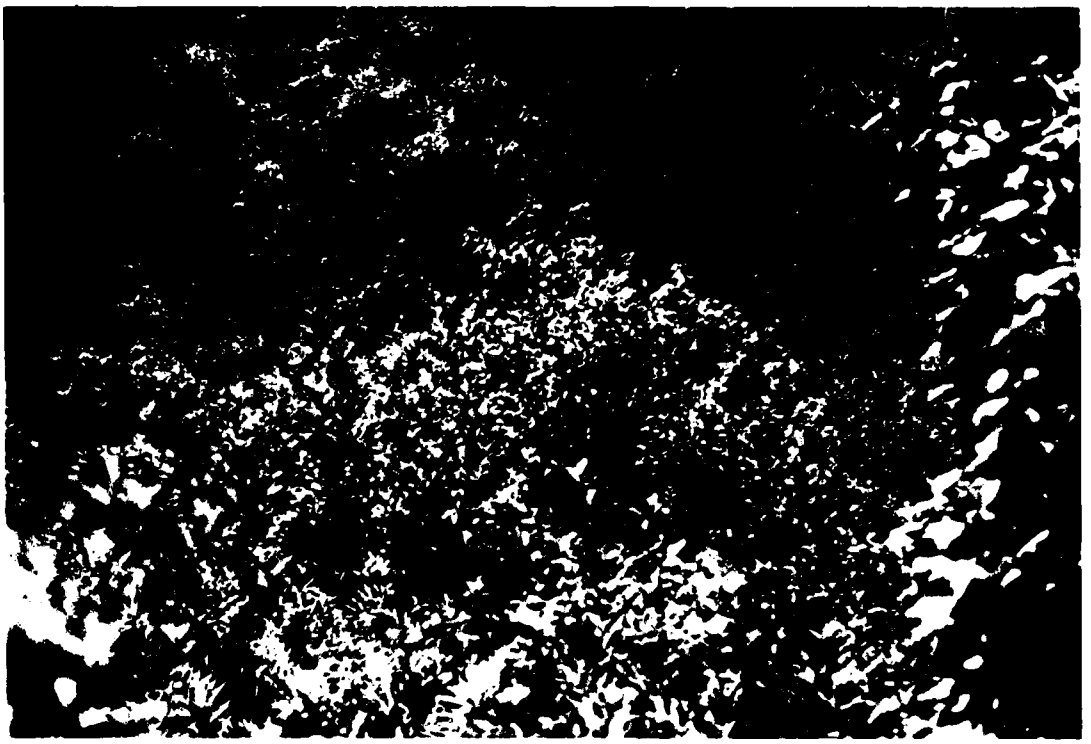
(5) LOW LEVEL OUTLET PIPE, OUTLET STRUCTURE AND CHANNEL FLOOR

(6) DOWNSTREAM LOW LEVEL OUTLET CHANNEL BLOCKED BY DEBRIS

(7) DOWNSTREAM LOW LEVEL OUTLET - SECONDARY CHANNEL

(8) UPSTREAM SLOPE OF EMBANKMENT LOOKING EAST
NOTE SETTLEMENT OF RIPRAP BETWEEN
WATERLINE AND LINE OF DEMARKATION INDICATED
BY GEOLOGIC HAMMER

(9) VIEW ACROSS SPILLWAY LOOKING EAST
NOTE HEADWALL IN BACKGROUND,
SPILLWAY CREST AND HEAVY VEGETATION



(10) DOWNSTREAM VIEW OF SPILLWAY CHANNEL
NOTE EXTREMELY HEAVY VEGETATION

(11) SILTATION BETWEEN UPSTREAM SLOPE OF EMBANKMENT
AND WEST SPILLWAY UPSTREAM APPROACH WALL

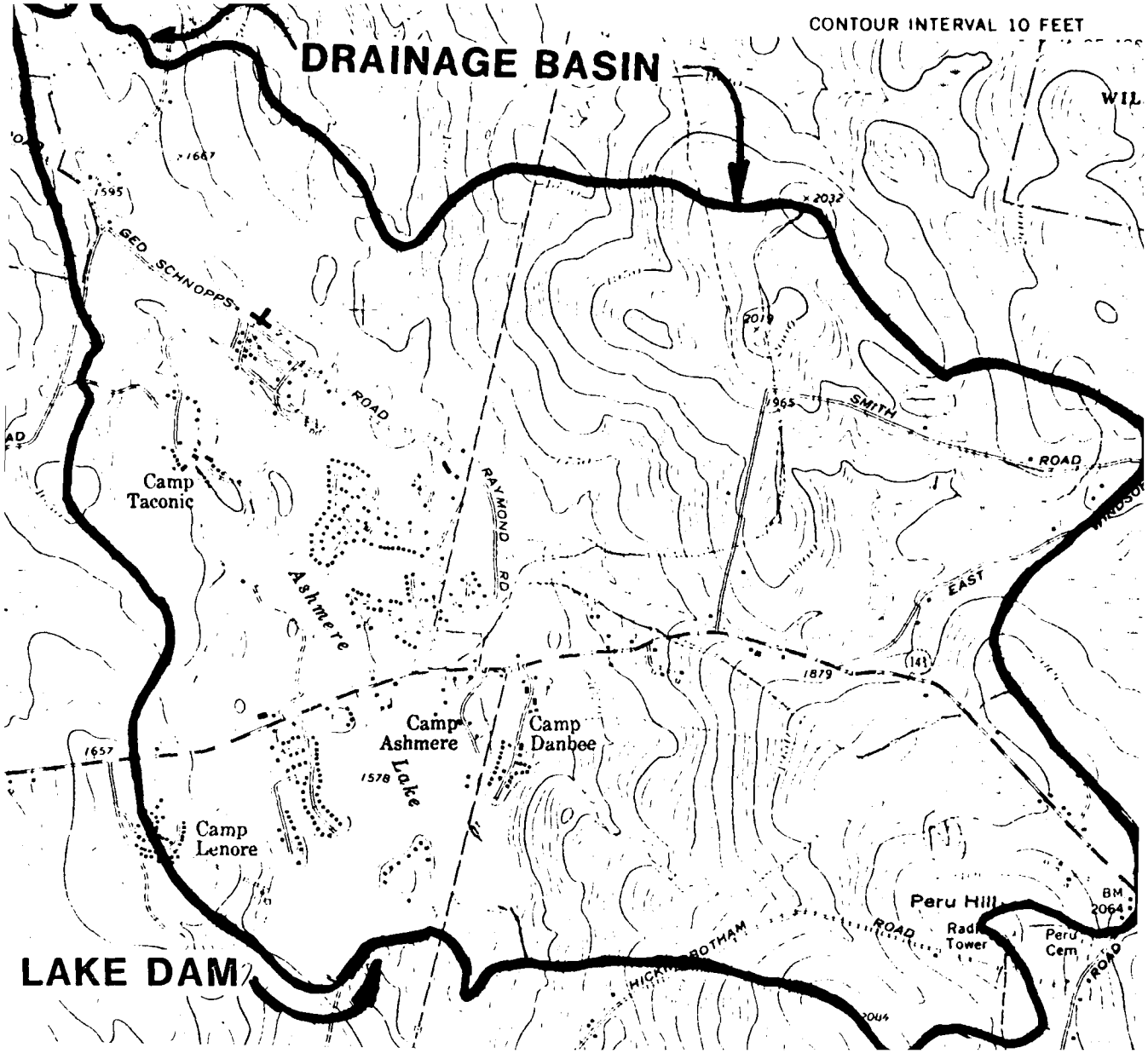
(12) EROSION AND DISPLACEMENT OF RIPRAP

(13) SEEPAGE AREA AT DOWNSTREAM TOE
NOTE EXTREMELY HEAVY SWAMP LIKE VEGETATION

(14) SEEPAGE AREA AT DOWNSTREAM TOE
NOTE EXTREMELY HEAVY SWAMP LIKE VEGETATION

HYDROLOGIC DATA & COMPUTATIONS

APPENDIX D


CONTOUR INTERVAL 10 FEET
DRAINAGE BASIN
LAKE DAM
GEO. SCHNOPPS
ROAD
Camp
Taconic
RAYMOND RD.
Ashmere
EAST
SMITH
ROAD
Camp
Ashmere
Lake
Camp
Danbee
Camp
Lenore
Peru Hill
BM
2064
ROAD
Radio
Tower
Peru
Cem
ROAD
HICKAM
BOTHAM
1595
1657
1578
1879
2032
2019
965

TAMS

1497-03

INSPECTION.

ASHMERE LAKE DAM

Sheet 1 of
Date July 13
By D.L.C
Ch'k. by

Unit Hydrograph computation for Stream Basin.

Δ EL. 550 Ft

Basin Length 1400 Ft

DRAINAGE AREA. — 0.7[illegible] sq mi

AVE BASIN SLOPE 550'/1400 0' = 0.039 or 3.9%

Time of Concentration T_c (Ref [illegible] 1971)

Length = 14,000 H = 550 T_c = 0.6 Hrs.

Lag Time L = 0.6 T_c

= 0.36 Hrs

D = 0.25 hrs (15 mins.)

$T_p = \frac{D}{2} + 0.6 T_c = \frac{0.25}{2} + (0.6)(0.6)$

= 0.125 + 0.36

T_p = 0.485 hrs

T_b = 2.67 T_p = (2.67)(0.485)

= 1.2[illegible] hrs

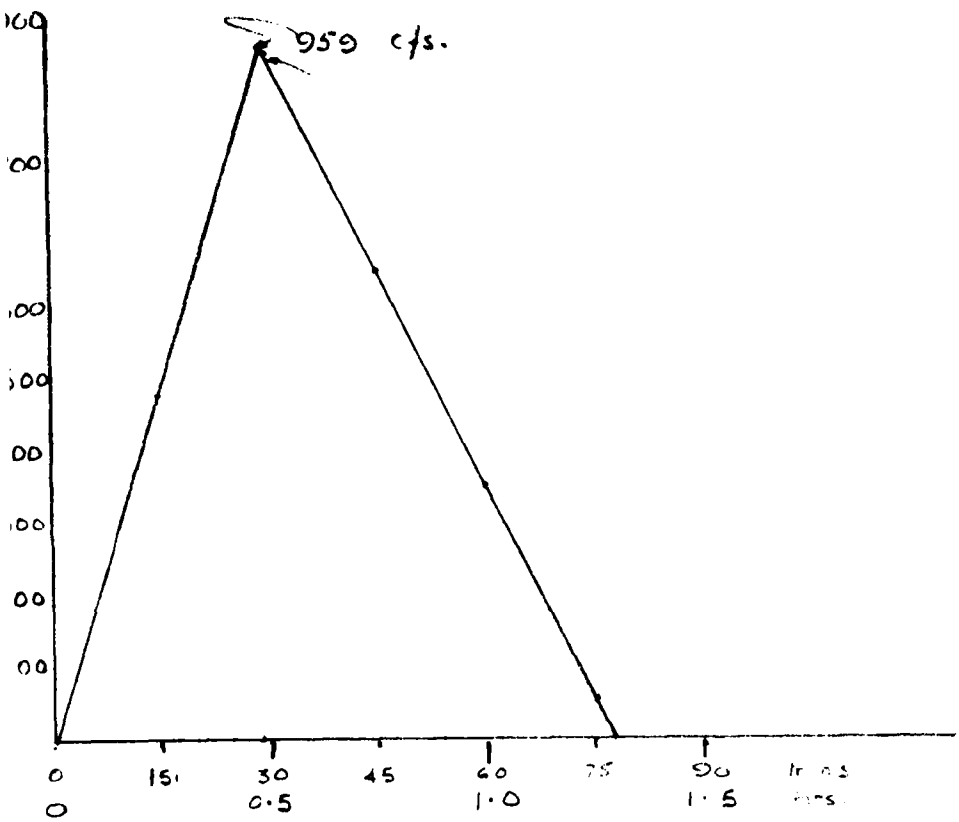
$q_p = \frac{484 A}{T_p} = \frac{(484)(0.461)}{0.485}$.

= 151 [illegible]s

TAMS

1497-03
Inspection
Ashmere Lake Dam

Sheet 2 of _____
Date 7/13/78
By D.L.C.
Ch'k. by _____



TAMS

497-03

Sheet 2A of _____

Date July 19 78

By D.C.C

Ch'k. by _____

Ashmere Lake Unit Hydrograph for unchanneled basin area

DRAINAGE AREA 1.79 Sq miles.

Lag 1 hour D = 1 hour

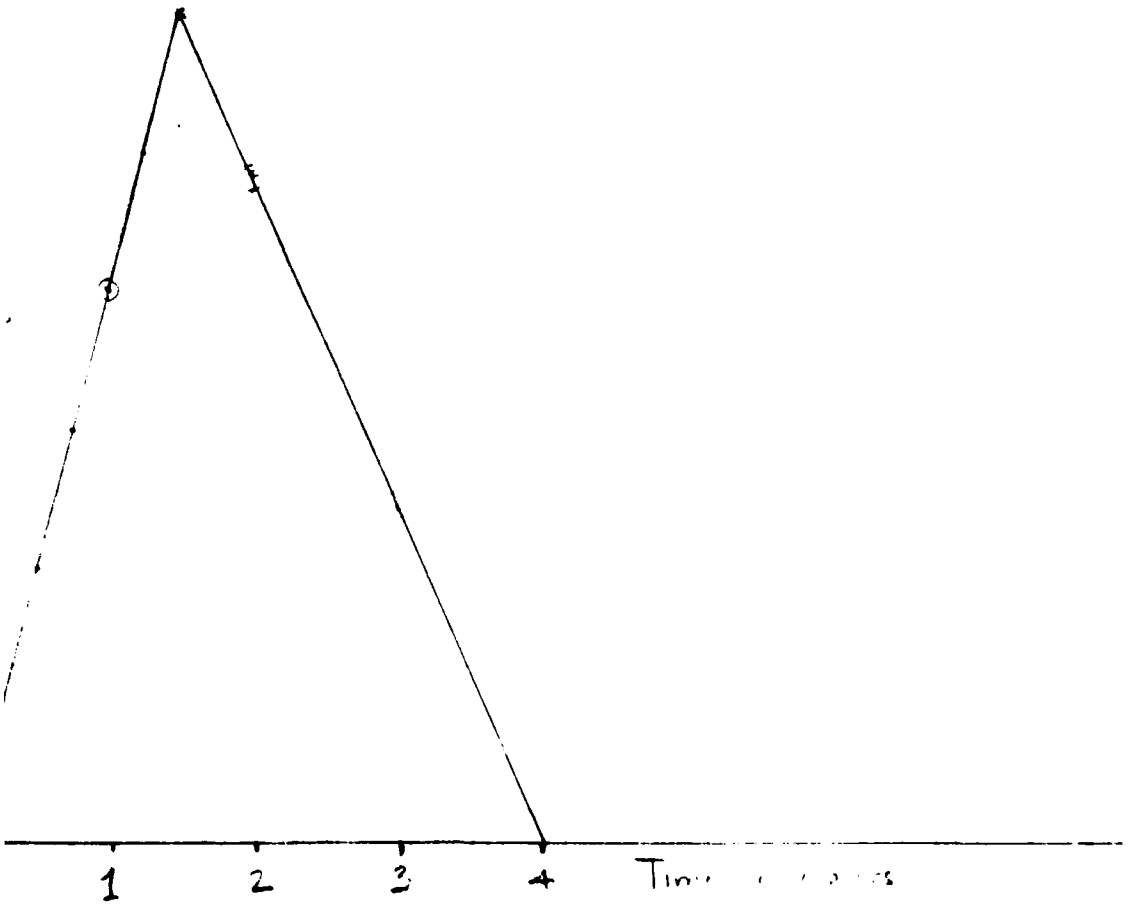
$\bar{T}_p = D/2 + 0.6\,T_c$ $\quad T_c = \frac{1}{0.6} = 1.67$

$= 0.5 + 1 = 1.5$ hours

$T_p = 2.67\,T_p - (2.67)(1.5)$

$= 4.00$

$Q_p = \frac{484\,A}{T_p} = \frac{(484)(1.79)}{1.5} = 578$ cfs



TAMS

197-03
DAM INSPECTION.
ASHMERE LAKE - P.M.P calculations.
EXCESS Rainfall

Sheet 3 of ____
Date JULY 17, 78
By D.L.C.
Ch'k. by ____

ssuming 0.2" loss per hour on land
No losses on lake

Excess Rainfall (ins)	Stream Unit Hydrograph	Basin Unit Hydrograph
0	0	0
0.323	475	97
0.323	949	193
0.341	650	289
0.376	350	386
0.518	50	482
0.607	0	578
0.678		520
0.803		462
0.767		405
0.891		347
0.891		289
1.016		231
1.175		173
1.371		116
2.205		58
1.620		0
0.448		
0.394		
0.394		
0.358		
0.287		
0.270		
0.269		
0.235		

16.56" TOTAL

TABLE 1

TAMS

Job No. 1497-03 Sheet 4 of _____

Project _____ Date July 18, 78

Subject ASHMERE LAKE DAM — SPILLWAY HEAD-DISCHARGE RELATIONSHIP COMPUTATION By D.L.C. Ch'k. by _____

L = 75.0 feet

Head feet	Elevation feet	C	$Q_{CFS} = CLH^{3/2}$
0	1578.0	0	0
0.5	1578.5	2.6	68.9
1.0	1579.0	2.64	198.
1.5	1579.5	2.72	374.8
2.0	1580.0	2.76	595.5
2.5	1580.5	2.89	856.8
3.0	1581.0	3.05	1188.6
3.5	1581.5	3.10	1566.6

TABLE 2

TAMS

Job No. 1497-03. Sheet 5 of _____

Project INSPECTION ASHMERE LAKE DAM Date JULY 20, 78

Subject INFLOW HYDROGRAPH COMPUTATION (½ PMF) By _____

Ch'k. by _____

Time (mins)		Lake Inflow	2 Riverbasins Inflow	Unchannel basin Inflow.	Total Inflow
0	C	0	0	0	0
15	.2	137.3	153.4	15.7	306.4
30	.5	137.3	459.9	46.8	644.0
		143.9	678.5	94.4	916.8
60	1	156.8	825.2	160.2	1142.2
	1.2	320.5	1072.0	262.9	1655.4
90		346.3	1531.0	408.6	2285.9
		346.3	1975.4	572.2	2893.9
120	2.0	392.3	2388.7	779.6	3560.6
	2.5	450.8	2895.2	1032.9	4378.9
150	3.0	614.6	3748.7	1363.5	5726.8
	3.5	829.9	4258.8	1700.5	6789.2
180	4.0	523.0	3741.5	2007.4	6271.9
		313.9	2828.0	2969.1	5411.0
210		267.9	2043.8	2469.2	4780.9
		241.8	1612.4	2569.1	4423.3
240		209.0	1976.4	2510.8	4106.2
		183.3	1195.4	2395.3	3774.0
270	4.5	163.4	1032.9	2236.7	3461.0
		163.4	982.8	2052.6	3198.8
300	5.	150.2	892.5	1855.2	2896.0
	5.5	124.0	790.9	1635.0	2549.9
330		117.8	715.6	1428.3	2261.7
		117.4	602.8	1290.4	2010.4
360	6	117.4	506.7	1039.3	1663.4
	11.				0.
	29.				0

TAMS

Job No. 1497-03 Sheet 6 of ___

Project DAM INSPECTION Date 7/18/78

Subject ASHMERE LAKE By M. GONZALEZ

SURCHARGE STORAGE Ch'k. by ___

ELEV.	AREA	MEAN AREA	Δ VOL.	SURCHARGE VOL (AF)
1578.0	184			0
		189.7	94.85	
1578.5	195.4			94.85
		201.2	100.75	
1579.0	206.9			195.60
		212.7	106.35	
1579.5	218.4			301.95
		224.2	112.10	
1580.0	229.9			414.05
		235.7	117.85	
1580.5	241.4			531.90
		247.2	123.6	
1581.0	252.9			655.50
		258.7	129.35	
1581.5	264.4			784.85

cc $784/(53.3 \times 4) \approx 3.7$ inches of Runoff

TABLE 4

1497-03
ASHMERE LAKE
DAM INSPECTION
INFLOW HYDROGRAPH PMF

INPUT PARAMETERS

STARTING ELEV (FT.)	TIME INTERVAL (HOURS)	STARTING TIME (HOURS)	ENDING TIME (HOURS)	PRINT INTERVAL	GATE OPTION	PLOT OPTION	STORAGE COEF.	OUTFLOW COEF.	INFLOW COEF.	TIME COEF.	BREAK TIME
1578.00	0.08	0.00	9.74	1	NO	YES	1.000	1.000	1.000	1.000	0.000

RESERVOIR ELEV. (FT.)	RESERVOIR STORAGE (ACFT)	RESERVOIR OUTFLOW (CFS)
1578.00	0.0000	0.00
1578.50	94.8500	68.90
1579.00	195.6000	198.00
1579.50	301.9500	374.80
1580.00	414.0500	585.50
1580.50	531.9000	856.80
1581.00	655.5001	1188.60
1581.50	784.8500	1566.60

(HRS)	(CFS)	(CFS)	(ACFT)	(FT.)
0.00	0.00		0.0000	1578.00
0.08	210.13	0.52	0.7189	1578.00
0.17	420.27	2.08	2.8721	1578.01
0.25	630.41	4.68	6.4525	1578.03
0.33	819.93	8.26	11.3824	1578.06
0.41	1009.45	12.77	17.5846	1578.09
0.50	1198.97	18.19	25.0528	1578.13
0.58	1364.98	24.48	33.7001	1578.17
0.66	1530.69	31.55	43.4394	1578.22
0.75	1696.41	39.41	54.2641	1578.28
0.83	1832.63	47.99	66.0683	1578.34
0.91	1968.12	57.19	78.7428	1578.41
1.00	2103.60	67.03	92.2817	1578.48
1.08	2288.55	84.25	106.8303	1578.55
1.16	2475.34	104.35	122.5220	1578.63
1.24	2662.14	125.92	139.3524	1578.72
1.33	2899.14	149.15	157.4826	1578.81
1.41	3138.68	174.27	177.0814	1578.90
1.49	3378.22	202.22	198.1435	1579.01
1.58	3631.79	239.67	220.6702	1579.11
1.66	3886.25	279.58	244.6741	1579.23
1.74	4140.72	321.92	270.1413	1579.35
1.83	4428.34	366.85	297.1684	1579.47
1.91	4718.55	419.71	325.8443	1579.60
1.99	5008.76	476.63	356.1318	1579.74
2.07	5223.13	536.06	387.7509	1579.88
2.16	5430.51	600.11	420.3991	1580.02
2.24	5637.89	677.41	453.9786	1580.16
2.32	5877.82	757.01	488.5542	1580.31
2.41	6121.22	839.14	524.2327	1580.46
2.49	6364.61	934.85	560.9772	1580.61
2.57	6569.03	1035.79	598.5765	1580.76
2.66	6769.29	1138.57	636.8649	1580.92
2.74	6969.55	1247.94	675.8094	1581.07
2.82	7211.40	1363.90	715.4871	1581.23
2.90	7458.32	1482.39	756.0371	1581.38
2.99	7705.23	1603.44	797.4592	1581.54
3.07	8022.18	1727.68	839.9738	1581.71
3.15	8348.72	1855.84	883.8298	1581.88
3.24	8675.26	1987.94	929.0329	1582.05
3.32	9075.16	2124.63	975.8057	1582.23
3.40	9486.29	2266.64	1024.4043	1582.42
3.49	9897.41	2414.01	1074.8303	1582.62
3.57	10756.40	2571.04	1128.5683	1582.82
3.65	11691.14	2742.77	1187.3305	1583.05
3.73	12625.88	2929.63	1251.2746	1583.30
3.82	13128.92	3127.05	1318.8317	1583.56
3.90	13551.74	3329.74	1388.1921	1583.83
3.98	13974.55	3536.80	1459.0473	1584.10

(HRS)	(CFS)	(CFS)	(ACFT)	(FT.)
4.07	13560.89	3739.85	1528.5275	1584.37
4.15	12977.39	3928.96	1593.2429	1584.62
4.23	12393.89	4102.75	1652.7111	1584.85
4.32	11675.92	4260.17	1706.5798	1585.06
4.40	10928.26	4399.92	1754.4028	1585.24
4.48	10180.60	4522.06	1796.1992	1585.40
4.56	9528.25	4627.89	1832.4123	1585.54
4.65	8898.69	4718.90	1863.5539	1585.66
4.73	8269.13	4795.60	1889.8020	1585.77
4.81	7872.44	4860.60	1912.0444	1585.85
4.90	7535.78	4917.03	1931.3552	1585.93
4.98	7199.13	4965.66	1947.9963	1585.99
5.06	6943.51	5007.65	1962.3640	1586.05
5.15	6753.95	5044.38	1974.9350	1586.10
5.23	6544.40	5076.23	1985.8334	1586.14
5.31	6322.75	5103.17	1995.0512	1586.17
5.39	6097.74	5125.14	2002.5695	1586.20
5.48	5872.74	5142.21	2008.4106	1586.22
5.56	5663.87	5154.64	2012.6623	1586.24
5.64	5459.79	5162.72	2015.4274	1586.25
5.73	5255.71	5166.59	2016.7519	1586.26
5.81	5056.44	5166.38	2016.6804	1586.26
5.89	4858.70	5162.23	2015.2622	1586.25
5.98	4660.96	5154.25	2012.5293	1586.24
6.06	4369.90	5141.57	2008.1909	1586.22
6.14	4047.17	5123.05	2001.8542	1586.20
6.22	3724.45	5098.50	1993.4516	1586.17
6.31	3428.97	5068.29	1983.1167	1586.13
6.39	3143.33	5032.93	1971.0136	1586.08
6.47	2857.69	4992.59	1957.2109	1586.03
6.56	2603.40	4947.70	1941.8488	1585.97
6.64	2361.14	4898.77	1925.1054	1585.90
6.72	2118.89	4846.00	1907.0493	1585.83
6.81	1917.38	4789.88	1887.8444	1585.76
6.89	1732.48	4731.04	1867.7087	1585.68
6.97	1547.59	4669.69	1846.7170	1585.60
7.05	1396.37	4606.23	1825.0004	1585.52
7.14	1259.70	4541.17	1802.7375	1585.43
7.22	1123.03	4474.69	1779.9882	1585.34
7.30	1000.95	4406.96	1756.8117	1585.25
7.39	885.54	4338.22	1733.2888	1585.16
7.47	770.14	4268.55	1709.4489	1585.07
7.55	683.51	4198.26	1685.3962	1584.98
7.64	610.05	4127.78	1661.2773	1584.88
7.72	536.58	4057.24	1637.1381	1584.79
7.80	483.49	3986.84	1613.0483	1584.70
7.88	440.24	3916.89	1589.1093	1584.60
7.97	396.99	3847.46	1565.3518	1584.51
8.05	358.77	3778.60	1541.7890	1584.42
8.13	323.12	3710.38	1518.4431	1584.33

	(HRS)	(CFS)	(CFS)	(ACFT)	(FT.)
	8.22	287.46	3642.80	1495.3183	1584.24
	8.30	256.10	3575.90	1472.4250	1584.15
	8.38	227.04	3509.72	1449.7807	1584.07
	8.47	197.99	3444.29	1427.3886	1583.98
	8.55	173.15	3379.61	1405.2578	1583.89
	8.63	150.72	3315.76	1383.4057	1583.81
	8.71	128.28	3252.72	1361.8349	1583.73
	8.80	109.55	3190.53	1340.5524	1583.64
	8.88	93.05	3129.22	1319.5727	1583.56
	8.96	76.54	3068.80	1298.8972	1583.48
	9.05	62.83	3009.28	1278.5295	1583.40
	9.13	50.87	2950.68	1258.4790	1583.33
	9.21	38.92	2893.01	1238.7451	1583.25
	9.30	29.48	2836.28	1219.3300	1583.17
	9.38	21.70	2780.50	1200.2419	1583.10
	9.46	13.92	2725.67	1181.4797	1583.03
	9.54	8.63	2671.80	1163.0456	1582.96
	9.63	5.06	2618.91	1144.9472	1582.89
	9.71	1.50	2567.00	1127.1838	1582.82
MAX. VALUES		13974.55	5166.59		1586.26
MIN. VALVES		0.00	0.00		1578.00

APPENDIX E

INFORMATION AS CONTAINED IN

THE NATIONAL INVENTORY OF DAMS

STATE	IDENTITY NUMBER	DIVISION	STATE	COUNTY	CONGR DIST.	STATE	COUNTY	CONGR DIST.	NAME	LATITUDE (NORTH)	LONGITUDE (WEST)	REPORT DATE DAY | MO | YR
MA	223	NED	MA	003	01				ASHMERE LAKE DAM	4226.2	7305.0	15AUG78

POPULAR NAME	NAME OF IMPOUNDMENT
	ASHMERE LAKE

REGION	BASIN	RIVER OR STREAM	NEAREST DOWNSTREAM CITY-TOWN-VILLAGE	DIST FROM DAM (MI.)	POPULATION
01	07	BENNTT BROOK	HINSDALE	3	1600

TYPE OF DAM	YEAR COMPLETED	PURPOSES	STRUCTURAL HEIGHT (FT.)	HYDRAULIC HEIGHT (FT.)	IMPOUNDING CAPACITIES MAXIMUM (ACRE-FT.)	IMPOUNDING CAPACITIES NORMAL (ACRE-FT.)	DIST	OWN	FED R	PRV/FED	SCS A	VER/DATE
REPG	1875	R	35	33	3220	2435	NED	N	N	N	N	10AUG78

REMARKS

D/S HAS	SPILLWAY CREST LENGTH	SPILLWAY TYPE	SPILLWAY WIDTH (FT.)	MAXIMUM DISCHARGE (FT.)	VOLUME OF DAM (CY)	POWER CAPACITY INSTALLED (MW)	POWER CAPACITY PROPOSED (MW)	NAVIGATION LOCKS NO.	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)
1	1574	U	75	1570	188000											

OWNER	ENGINEERING BY	CONSTRUCTION BY
COMM OF MASSACHUSETTS		

REGULATORY AGENCY			
DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	NONE	NONE

INSPECTION BY	INSPECTION DATE DAY | MO | YR	AUTHORITY FOR INSPECTION
TIPPETTS-ABBETT-MCCARTHY-STRATTON	27OCT75	PL 92-367

REMARKS

END

FILMED

7-85

DTIC